



# CHRISTOPHER DELGADO

Senior Fellow, World Resource Institute, Former Economics and Policy Advisor & Practice Leader, Agricultural and Environmental Services, World Bank

**Jean-Yves Carfantan, Senior Consultant, AgroBrasConsult**

The first topic will be addressed by Christopher Delgado, who will give us an overview of the world situation, and will also address the question of global security governance and talk about how international organisations have been working. He will also address the question of the different trends that will impact on global food security in the coming years. Right after Christopher, Marcos Jank will talk about the trade aspects of food security and the connections between international agricultural trade policy and food security.

**Christopher Delgado, Senior Fellow, World Resource Institute, Former Economics and Policy Advisor & Practice Leader, Agricultural and Environmental Services, World Bank**

I just want to add a personal note before I start. I began my career in Chad in 1970 as a Peace Corps volunteer almost by accident, and at that time food security was very much a topic that people everywhere in policy paid attention to. It got worse during the 1970s, and then it kind of tapered away as a topic. I joined the World Bank eventually in 2006; I was a researcher in between, and in 2006 the World Bank was at least considering abolishing the agriculture department, and if I am not mistaken the African Development Bank did abolish the agriculture department, and many of the other multilateral banks did. Then we had events in 2008.

I retired from the Bank about a month ago, but one of the things I became convinced about is that, now that prices have come down a bit, the world is getting complacent again, as we did in the 1980s and 1990s, only the situation is very different, and in fact with climate change we face a food security disaster that seems almost certain. That is what I will try to convince you of.

Starting with the state of food insecurity, the Director General of the FAO has said it much more eloquently than I can, and I do not want to go over it. Three-quarters of the world's really poor people, those who live on less than USD1.25 a day, all things counted in 2005 dollars, are rural, and most of them get a good share of their livelihoods from farming. They depend on the natural capital that allows them to farm. They are very vulnerable to climate change.

A very inconvenient fact is that the world needs more food; in fact, the UN has just upped its estimates of population change to 2050 to about 9.6 billion, so depending on the old or the new estimates, it is about a 2-3 billion increase in mouths to feed by 2050. They are changing diets; you still have a little less than two billion people in Asia alone that will go over the USD2 a day mark where they start diversifying into meat, and even if you do not fully count that, you need at least another one and a half billion tonnes of cereal, 200 million tonnes of meat and 130 million tonnes of oil seeds. We do not normally think about things this way, but I just want to put it in context.

This requires more agricultural intensification. It would have been a hard task anyway, because the low-hanging fruit were picked by the Green Revolution, which has occurred in most parts of the world except in large parts of Africa. Two veterans of FAO have calculated that to have what you need without climate change, just with business as usual, you need 150 cubic kilometres a year more of water, 100 million tonnes more of fertiliser, and so forth.

Let us look at global food markets; now we get to the more economic way of looking at things. Basically, over the last 60 years or so, production has more or less kept up with demand, but in looking to the period just before what we might call a series of food price crises, what happened is that output fell behind utilisation, which has grown faster than expected. Even if you update that, you find there has been some slackening, which is why prices have slackened, but the things that led to food price volatility in 2008-2012 have not really gone away. You still have rising grain demand, particularly from the emerging countries; you still have and will continue to have variable output; and when you have resulting low stocks you tend to have uncertainty and market behaviour that produces volatility. All this is exacerbated



for price volatility by the fact that, as people get richer over time, their price responsiveness for food goes down, and thus prices need to go up more before demand and supply rebalance, other things equal.

Therefore, you have structural factors that are producing more price volatility and the likelihood that prices will stay high; this is a long-term structural trend. When the stock-to-use ratio for food grains falls below about 15%, markets get nervous and typically prices start to go up; this is not established as a causal relationship, but it nevertheless a well documented association. Regarding the number of reported occurrences, the reporting may have improved and so forth, but there is really not much doubt that over time we have had far more extreme weather events in the world. Policies have done their bit too; you have grain trade restrictions that were slapped on in 2008-2010, and you have a variety of other rigidities from biofuels mandates in 20 countries, not just the US. You have the build-up of public grain reserves in 2008 and 2010 in the face of rising prices.

Half the world's rice and wheat stocks at any one time are held in India and China, and most of them are under public control. When you have unpredictable publicly controlled release of grain on the world market, it can be destabilising from the point of view of private traders. These are the same people whom you are asking to invest in the business. The general set of issues associated with food price volatility was one of the major foci of the G20 under the French presidency in 2011.

The bottom line on grain prices is that, though they have come down somewhat this year, the fundamental structural phenomena underlying what has happened recently have not gone away, and uncertainty has gone up. Uncertainty is risk of events that you do not know the distribution of, so you cannot really insure it. Risk management becomes a big issue. Exports from the OECD in wheat have gone up very little since 1990; all the huge growth in the market has been supplied by Latin America and the Black Sea region, with a market share going from about 11% to 35% now. The Black Sea region and Latin America are both much more variable climatically than the OECD; it is just the way nature is right now, so even without anything else going on, you can see that international markets will be more volatile over time, another structural factor.

Regarding the medium-term outlook, using the OECD-FAO figures, if you look forward ten years, the view is that animal products will continue to go up in price and just about everything else will go down 15-30%. This is a fairly mechanical projection that does not take into account climate change, which you would not expect to happen, but one of the factors you have to take into account is that most of the growth in agriculture in the next ten years will be led by the developing countries and the BRICs. That will be 57% of the production growth; that is where production is growing. That will be quite relevant to an argument I will make later.

Biofuels use is expected to go up, and most of the growth in meat and milk production will be in developing countries, half of it in China and India. China is always the big factor; it feeds 20% of the global population on 9% of the arable land and 6% of the fresh water. They have done a heck of a job despite population increase. I think China recognises they cannot keep doing this. China is becoming a major world importer, and they are changing their policy stances rapidly in view of that. China is already influencing world agricultural markets in important ways. It is not the only factor but it is an important one. Basically, the BRICs hold the future of agricultural markets in their hands.

Things might seem to be looking up for both food producers and consumers. You have widespread improvements, except in Africa, in total factor productivity since 1990 – we are more productive. You have significant improvement in global agricultural policies, which 20 years ago were quite discriminatory against producers. That is not so true anymore, and in fact, if anything, developing countries are beginning to subsidise agriculture.

Therefore, you have a seriousness of purpose towards agriculture and food since 2008, and you have major players like China that are becoming increasingly engaged in world markets and behaving very responsibly in world markets compared to previous eras. That is a good thing. The problem is that the game-changer is climate change. Even without climate change, things are more difficult now for maintaining agricultural growth compared to the 1970s. We will not have the policy response or technical abilities to increase production that were put into play in the 1970s. However, even so the world would probably muddle through, because it always does, but this will not happen with climate change.



Acceleration in climate change seems to be happening, and even climate change of two degrees by 2050, which right now is a good outcome, could send the world backwards with reductions of food per capita of the order of 10-20% instead of the aggregate increase we want to see. We think some effects may happen in Southeast Asia as early as 2030 instead of 2050, and I can assure you the governments in Southeast Asia are mostly conscious of this, particularly in places like Vietnam, and they are extremely worried.

Basically, scientific work shows that for every degree of global warming you get about a 5% decrease in yield of the major cereals. That is huge, since you are relying on yield increase to get the production you need. Instead of getting your 50% or 70% increase by 2050, depending on your estimate, you might actually get an aggregate decrease of as much as 20%. You have flooding already with rice intrusion; three rivers, the Tropic, the Mekong and the Irrawaddy in Southeast Asia account for 40% of the world's rice production, and there is already major saline intrusion there. You could easily see an Africa where large numbers of farmers have to switch to livestock only, according to some studies.

Some careful work by IFPRI in 2010 for South Asia looked at this; it was biophysical and economic modelling that basically showed that, without climate change, you could count on the kinds of annual yield growth you would need in the major cereals, but with climate change you definitely could not. The places that are most vulnerable to climate change are really the tropics, and the governments in the tropics are far more conscious of these problems than governments outside the tropics. The problem is that most governments in the tropics do not think that climate change is their problem; they think it is a problem that came from somewhere else. Therefore, you have a kind of political stasis, because without the participation of the BRICs and the developing countries, you will not have a solution globally to climate change. However, they do not think it is their problem, though they know it is a problem for them.

Agriculture is in a particularly bad position, because at least 25% of global greenhouse gases every year, the anthropogenic ones, come from agriculture. The other energy sector and the other places where you get greenhouse gases are not doing the job as it is, but if agriculture is not part of the solution, they would have to do at least one-third more. There are ways to mitigate climate change through agricultural action at the same time as raising productivity and increasing resilience, but you have to target that.

Going forward, we need to think about climate-smart agriculture everywhere. Basically, it is possible to reduce carbon emissions, and in agriculture the separation between adaptation to climate change and mitigation of climate change is basically artificial, because in the tropics you are mostly trying to increase the carbon content of soil, which is very good for productivity and very good for resilience; it is also good for mitigation. Certainly, governments, whether in the developed or developing world, will not do it alone, and there is a lot of thought on how you can mobilise the private sector.

The big messages for agricultural policy are as follows. Food price volatility is a long-term phenomenon; even though it has gone down a bit recently, it will come back, and if we get complacent we will be as unprepared next time as we were in 2008. Like any industry, you have to build trust in mutual benefit, and trust in mutual benefit is pretty scarce in global agriculture right now. There should be increased attention to risk management and greater resilience, and the policy incentives we have should be shifted to promoting triple wins, that is, more productivity, better resilience and mitigation all at the same time.

The key areas multilaterals should really emphasise going forward are as follows. This is what I said in the World Bank when it was my job to do so, and I will say it now. We need to climate-proof agriculture; we need to help clients find ways to manage and mitigate the increased levels of agricultural and environmental risks. I am sure the Minister will address that, because I know it is a great preoccupation of all governments in the tropics now. Private sector response should be leveraged in a way that helps countries meet their objectives. Most importantly, multilaterals really need to work together; multilaterals, even the World Bank, are too small to have any impact individually unless they have a variety of partners. Join global partnerships, bring what multilaterals can bring in terms of knowledge, and convene forums to harmonise and align efforts around international priorities.

I chose four quick initiatives because I was involved in all of them. There is the Climate Smart Agriculture Alliance which was just launched in Durban; this is a wide variety of countries and organisations, including the FAO, the World Bank and others, to find the technical themes that can allow these triple wins. We need to manage and mitigate



increased levels of price uncertainty. AMIS was created under the French presidency of the G20. It is housed at FAO and is run by nine multinational organisations; it is financed by the World Bank and FAO to a large extent. This is an absolutely critical way to increase transparency, and I have heard a number of people, including at ministerial level in important countries, saying that AMIS is one of the reasons we did not have the behaviour in 2010 and 2011 that we had in 2008. We need to join global partnerships to harmonise and align efforts around national priorities. There is something called the Global Agriculture and Food Security Programme, which has about USD1.5 billion in pledges, and supports CADIP, primarily in Africa; about 60% of the funds go to Africa and the rest to IDA-eligible countries. These are grants available so that, when countries follow aid-effectiveness procedures, there is a pot of money that they can compete for. Finally, there is a need to leverage private sector response.